WHAT IS CLAIMED IS:

1. A non-aggregating, non-immunogenic anuclear cellular composition comprising:

a) a mammalian anuclear cell having a cell surface and antigenic determinants on said surface;

b) a sufficient amount of hydrophilic, biocompatible, non-immunogenicity providing compound or polymer covalently attached to said surface so that recognition of said antigenic determinants on said surface is blocked by said covalently bonded hydrophilic, biocompatible, non-immunogenicity providing compound or polymer.

2. A non-immunogenic nuclear cellular composition in which at least 25% by number of nuclear cells in said composition remain viable for 96 hours comprising:

a) a mammalian nuclear cell having a cell surface and antigenic determinants on said surface;

b) a sufficient amount of hydrophilic, biocompatible, non-immunogenicity providing compound or polymer covalently attached to said surface so that recognition of said antigenic determinants on said surface is blocked by said covalently bonded hydrophilic, biocompatible, non-immunogenicity providing compound or polymer.

3. A non-immunogenic nuclear cellular composition having insufficient amounts of toxic materials within said composition to be toxic to nuclear cells within said composition comprising:

a) a mammalian nuclear cell having a cell surface and antigenic determinants on said surface;

b) a sufficient amount of hydrophilic, biocompatible, non-immunogenicity providing compound or polymer covalently attached to said surface so that recognition of said antigenic determinants on said surface is blocked by said covalently bonded hydrophilic, biocompatible, non-immunogenicity providing compound or polymer.

4. A non-immunogenic anuclear or nuclear cellular composition comprising:

a) a mammalian anuclear or nuclear cell having a cell surface and antigenic determinants on said surface;

b) a sufficient amount of hydrophilic, biocompatible, non-immunogenicity providing compound or polymer covalently attached to said anuclear or nuclear surface so that recognition of said antigenic determinants on said anuclear or nuclear cell surface is blocked by said covalently bonded hydrophilic, biocompatible, non-immunogenicity providing compound or polymer, said composition being free of any by-products from the covalent attachment of said hydrophilic, biocompatible, non-immunogenicity providing compound or polymer to said anuclear or nuclear cell surface.

5. A non-immunogenic cellular composition having insufficient amounts of toxic materials within said composition to be toxic to said cells comprising:

a) a mammalian cell having a cell surface and antigenic determinants on said surface;

b) a sufficient amount of hydrophilic, biocompatible, non-immunogenicity providing compound or polymer covalently attached to said anuclear or nuclear surface so that recognition of said antigenic determinants on said anuclear or nuclear cell surface is

blocked by said covalently bonded hydrophilic, biocompatible, non-immunogenicity providing compound or polymer.

6. A viable non-immunogenic nuclear cellular composition comprising:

a) a mammalian nuclear cell having a cell surface and antigenic determinants on said surface;

b) a sufficient amount of hydrophilic, biocompatible, non-immunogenicity providing compound or polymer covalently attached to said cell surface so that recognition of said antigenic determinants on said cell surface is blocked by said covalently bonded hydrophilic, biocompatible, non-immunogenicity providing compound or polymer.

Sub a1 cont

7. A non-immunogenic cellular composition comprising:

a mammalian cell having a cell surface and antigenic determinants on said cell surface;

an amount of a hydrophilic, biocompatible, non-immunogenicity providing compound or polymer covalently attached to said cell surface directly or by means of linking moieties, so that recognition of said antigenic determinants on said cell surface is blocked by said attached hydrophilic, biocompatible, non-immunogenicity providing compound or polymer.

8. The cellular composition of claim 1 wherein said hydrophilic, biocompatible, non-immunogenicity providing compound or polymer is a polyalkylene glycol.

9. The cellular composition of claim 2 wherein said hydrophilic, biocompatible, non-immunogenicity providing compound or polymer is methoxypolyethylene glycol.

10. The cellular composition of claim 1 wherein said hydrophilic, biocompatible, non-immunogenicity providing compound or polymer is dextran.

11. The cellular composition of claim 1 wherein said hydrophilic, biocompatible, non-immunogenicity providing compound or polymer is Ficoll.

12. The cellular composition of claim 1 wherein said hydrophilic, biocompatible, non-immunogenicity providing compound or polymer is arabinogalactan.

13. The cellular composition of claim 1 wherein said linking moieties are covalently attached to said antigenic determinants on said cell surface.

14. The cellular composition of claim 1 wherein said cell is an anuclear cell.

Sub a2

15. The cellular composition of claim 9 wherein said anuclear cell is a red blood cell.

16. The cellular composition of claim 10 wherein the antigenic determinants comprise a blood group antigenic determinants.

17. The cellular composition of claim 9 wherein said anuclear cell is a platelet.

Sub a3

18. The cellular composition of claim 1 wherein said cell is a nucleated cell.

19. The cellular composition of claim 13 wherein said nucleated cell is a vascular endothelial cell.

20. The cellular composition of claim 13 wherein said nucleated cell is a hepatic cell.

21. The cellular composition of claim 13 wherein said nucleated cell is a neuronal cell.

22. The cellular composition of claim 13 wherein said nucleated cell is a pancreatic cell.

23. The cellular composition of claim 13 wherein said nucleated cell is an epithelial cell.

24. A method of producing a non-immunogenic mammalian cell, said method comprising:

covalently attaching an amount of a hydrophilic, biocompatible, non-immunogenicity providing compound or polymer to the cell surface, directly or by means of a linking moiety, so that said hydrophilic, biocompatible, non-immunogenicity providing compound or polymer blocks recognition of antigenic determinants on the cell surface and yields a non-immunogenic cell.

25. The method of claim 24 wherein said linking moiety is covalently attached to said antigenic determinants on said cell surface.

26. The method of claim 24 wherein said cell is a red blood cell.

27. The method of claim 26 further comprising transfusing a human with said non-immunogenic cell.

28. The method of claim 21 wherein said cell is part of a tissue or organ.

29. The method of claim 27 wherein said cell is a vascular endothelial cell forming an exposed antigenic surface of the tissue or organ.

30. The method of claim 29 further comprising transplanting said tissue or organ into a human.

Sub a5

31. A non-immunogenic cell produced by the method of claim 21.

32. A method of decreasing phagocytosis of a mammalian cell, said method comprising:

selecting a cell for introduction into a mammal, said cell having a cell surface and antigenic determinants on said cell surface;

covalently attaching an amount of a hydrophilic, biocompatible, non-immunogenicity providing compound or polymer to said cell surface, directly or by means of a linking moiety, so that said hydrophilic, biocompatible, non-immunogenicity providing compound or polymer blocks recognition of said antigenic determinants on said cell surface and produces a non-immunogenic cell; and

introducing said non-immunogenic cell into a mammal, wherein phagocytosis of said non-immunogenic cell is decreased as compared to phagocytosis of said cell.

33. The method of claim 32 wherein said linking moiety is covalently attached to said antigenic determinant on said cell surface.

34. The method of claim 32 wherein said cell is a red blood cell.

35. The method of claim 32 wherein said mammal is a human and said cell is from another human.

36. The method of claim 32 wherein said mammal is a human and said cell is from a non-human mammal.

37. A method of decreasing an adverse reaction to a transfusion, said method comprising:

selecting a red blood cell for transfusion into a mammal, said red blood cell having a cell surface and blood group antigenic determinants on said cell surface;

covalently attaching an amount of a hydrophilic, biocompatible, non-immunogenicity providing compound or polymer to said cell surface, directly or by means of a linking moiety, so that said hydrophilic, biocompatible, non-immunogenicity providing compound or polymer blocks recognition of said blood group antigenic determinants on said cell surface and produces a non-immunogenic red blood cell; and

transfusing a mammal with said non-immunogenic red blood cell, wherein adverse reaction to said transfusion of said non-immunogenic red blood cell is decreased as compared to transfusion of said selected red blood cell.

38. The method of claim 37 wherein said linker moiety is covalently attached to said blood group antigenic determinant on said cell surface.

39. The method of claim 37 wherein said mammal is a human and said red blood cell is from another human.

40. The method of claim 37 wherein said mammal is a human and said red blood cell is from a non-human subject.

41. A method of decreasing rejection of a transplanted mammalian cell, said method comprising:

selecting a cell for transplantation into a mammal, said cell having a cell surface and antigenic determinants on said cell surface;

covalently attaching an amount of a hydrophilic, biocompatible, non-immunogenicity providing compound or polymer to said cell surface, directly or by means of a linking moiety, so that said non-immunogenic compound blocks recognition of said antigenic determinants on said cell surface; and

transplanting said non-immunogenic cell into a mammal, wherein rejection of said transplanted cell is decreased as compared to rejection of said selected cell.

42. The method of claim 41 wherein said linker moiety is covalently attached to said antigenic determinant on said cell surface.

43. The method of claim 42 wherein said cell is part of a tissue or organ.

44. The method of claim 43 wherein said tissue or organ is perfused with an amount of activated polyethylene glycol or derivative thereof, wherein said activated polyethylene glycol or derivative thereof is formed by reaction of a linker molecule with a polyethylene glycol or derivative thereof, so that said activated polyethylene glycol or derivative thereof becomes covalently attached to said antigenic cell surface by said linking moiety.

45. The method of claim 44 wherein said linking moiety is covalently attached to said antigenic determinant on said cell surface.

46. The method of claim 43 wherein said cell is a vascular endothelial cell forming an exposed antigenic surface of said tissue or organ.

47. The method of claim 41 wherein said mammal is a human and said cell is from another human.

48. The method of claim 41 wherein said mammal is a human and said cell is from a non-human subject.

49. A method of decreasing antibody-induced aggregation of mammalian cells, said method comprising:

covalently attaching an amount of a hydrophilic, biocompatible, non-immunogenicity providing compound or polymer to the cell surface of each of a population of cells, directly or by means of linking moieties, so that said non-immunogenic compound blocks recognition of antigenic determinants on the cell surface, so as to produce non-aggregating cells, wherein antibody-induced aggregation of said non-aggregating cells is decreased as compared to antibody-induced aggregation of said cells prior to attachment of the hydrophilic, biocompatible, non-immunogenicity providing compound or polymer.

50. The method of claim 49 wherein said linking moieties are covalently attached to said antigenic determinants on said cell surface.

51. The method of claim 49 wherein said cells are red blood cells.

52. The method of claim 51 wherein said antigenic determinant comprises a blood group antigenic determinant.